5-2-2018. Suggested edito from Tre. David Xhmilton

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SUBSTITUTE FOR

HOUSE BILL NO. 5638

A bill to amend 1994 PA 451, entitled "Natural resources and environmental protection act," by amending section 32706c (MCL 324.32706c), as added by 2008 PA 181.

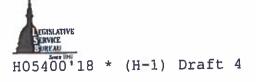
THE PEOPLE OF THE STATE OF MICHIGAN ENACT:

- 1 Sec. 32706c. (1) If the assessment tool determines that a
- 2 proposed withdrawal WITH A CAPACITY OF 1,000,000 GALLONS OF WATER
- 3 OR LESS PER DAY FROM THE WATERS OF THE STATE TO SUPPLY A COMMON
- 4 DISTRIBUTION SYSTEM is a zone B withdrawal in a cold-transitional
- 5 river system, or a zone C or zone D withdrawal, the property owner
- 6 shall-MAY submit to the department a-THE INFORMATION DESCRIBED IN
- 32706C(4)

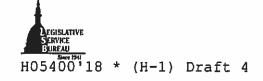
 7 SECTION 32706A(3) AND EITHER OF THE FOLLOWING:
- 8 (A) AN ANALYSIS OF THE PROPOSED WITHDRAWAL BY A PROFESSIONAL

CALCULATING THE 2 STREAMFLOW DEPLETION OF

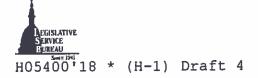
- 1 HYDROLOGIST OR HYDROGEOLOGIST, DEMONSTRATING THE PROPOSED WITHDRAWAL
- 2 IS NOT LIKELY TO CAUSE AN ADVERSE RESOURCE IMPACT. THE ANALYSIS
- 3 SHALL BE BASED ON AN AQUIFER PERFORMANCE TEST, STREAMFLOW DEPLETION
- 4 CALCULATIONS, AND GEOLOGICAL DATA CONSISTING OF AT LEAST 1 OF THE
- 5 FOLLOWING, WHICH SHALL BE INCLUDED WITH THE ANALYSIS:
- 6 (i) EVIDENCE THE PROPOSED WITHDRAWAL IS IN THE WATER
- AMANAGEMENT UNIT OR UNITS THAT WERE PART OF A REGIONAL OR WATERSHED
- 8 BASED STUDY OF WATER USE IMPACTS ACCEPTED BY THE DEPARTMENT UNDER
- 9 THIS SECTION OR SECTION 32706D. THE EVIDENCE MUST INCLUDE AN
- 10 AFFIDAVIT BY THE PROPERTY OWNER THAT THE PROPOSED WITHDRAWAL IS
- 11 LOCATED IN A RIVER SYSTEM AND AQUIFER INCLUDED IN THE STUDY, AND
- 12 RECORDS OF APPLICABLE DATA COLLECTED IN THE STUDY.
- 13 (ii) A HYDROGEOLOGIC ANALYSIS OF THE WATER MANAGEMENT UNIT OR
- 14 UNITS THAT WILL POTENTIALLY BE AFFECTED BY THE PROPOSED WITHDRAWAL,
- 15 INCORPORATING DATA FROM WELL LOGS, GAMMA RAY LOGS, SURFICIAL MAPS
- 16 OF THE GLACIAL GEOLOGY, GEOLOGIC CROSS SECTIONS, AND ANY OTHER
- 17 AVAILABLE HYDROGEOLOGIC DATA.
- 18 (B) REGISTRATION FOR A PROPOSED WITHDRAWAL THAT WILL DRAW
- 19 WATER FROM AQUIFERS SEPARATED FROM GLACIAL AQUIFERS BY BEDROCK.
- 20 (2) WITHIN 10 WORKING DAYS AFTER THE DEPARTMENT'S ACTUAL
- 21 RECEIPT OF THE ANALYSES AND SUPPORTING EVIDENCE AND DATA RELATED TO
- 22 THE PROPOSED WITHDRAWAL UNDER SUBSECTION (1), THE DEPARTMENT SHALL
- 23 DETERMINE WHETHER A PROPOSED WITHDRAWAL IS A ZONE A, ZONE B, ZONE
- 24 C, OR ZONE D WITHDRAWAL AND SHALL PROVIDE TO THE PROPERTY OWNER
- 25 WRITTEN NOTIFICATION OF ITS DETERMINATION. THE DEPARTMENT'S
- 26 DETERMINATION IS SUBJECT TO THE FOLLOWING:
- 27 (A) IF THE DEPARTMENT FAILS TO PROVIDE WRITTEN NOTIFICATION TO



- 1 THE PROPERTY OWNER WITHIN 10 WORKING DAYS AFTER THE ACTUAL RECEIPT
- 2 OF THE ANALYSES AND SUPPORTING EVIDENCE AND DATA, THE PROPERTY
- 3 OWNER MAY REGISTER THE WITHDRAWAL AND PROCEED WITH THE WITHDRAWAL.
- 4 (B) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
- 5 IS A ZONE A OR A ZONE B WITHDRAWAL, THE PROPERTY OWNER MAY REGISTER
- 6 THE WITHDRAWAL AND MAY PROCEED WITH THE WITHDRAWAL.
- 7 (C) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
- 8 IS A ZONE C WITHDRAWAL, THE PROPERTY OWNER MAY REGISTER THE
- 9 WITHDRAWAL AND PROCEED TO MAKE THE WITHDRAWAL IF THE PROPERTY OWNER
- 10 SELF-CERTIFIES THAT HE OR SHE IS IMPLEMENTING APPLICABLE
- 11 ENVIRONMENTALLY SOUND AND ECONOMICALLY FEASIBLE WATER CONSERVATION
- 12 MEASURES PREPARED UNDER SECTION 32708A THAT THE PROPERTY OWNER
- 13 CONSIDERS TO BE REASONABLE OR HAS SELF-CERTIFIED THAT HE OR SHE IS
- 14 IMPLEMENTING APPLICABLE ENVIRONMENTALLY SOUND AND ECONOMICALLY
- 15 FEASIBLE WATER CONSERVATION MEASURES DEVELOPED FOR THE WATER USE
- 16 ASSOCIATED WITH THAT SPECIFIC WITHDRAWAL THAT THE PROPERTY OWNER
- 17 CONSIDERS TO BE REASONABLE. A PROPERTY OWNER PROCEEDING UNDER THIS
- 18 SUBDIVISION SHALL PROVIDE 5 SETS OF WATER LEVEL RECOVERY
- 19 MEASUREMENTS, AS DESCRIBED IN AN AQUIFER PERFORMANCE TEST, TAKEN
- 20 AFTER PUMPING BETWEEN JUNE AND OCTOBER WITHIN 2 YEARS AFTER THE
- 21 PRODUCTION WELL IS PUT IN SERVICE. THE DEPARTMENT SHALL NOT REQUIRE
- 22 SUBMISSION OF ADDITIONAL INFORMATION OR DATA FROM A PROPERTY OWNER
- 23 PROCEEDING UNDER THIS SUBDIVISION.
- 24 (D) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
- 25 IS A ZONE D WITHDRAWAL, THE PROPERTY OWNER SHALL NOT REGISTER THE
- 26 WITHDRAWAL AND SHALL NOT MAKE THE WITHDRAWAL UNLESS THE PROPERTY
- 27 OWNER APPLIES FOR A WATER WITHDRAWAL PERMIT UNDER SECTION 32723 AND



- 1 THE WITHDRAWAL IS AUTHORIZED UNDER THAT SECTION, OR UNLESS IT IS
- 2 AUTHORIZED UNDER SUBSECTION (4). IN ADDITION TO THE WRITTEN
- 3 NOTIFICATION OF ITS DETERMINATION UNDER THIS SUBSECTION, IF THE
- 4 DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL IS A ZONE D
- 5 WITHDRAWAL, THE DEPARTMENT SHALL INCLUDE DOCUMENTATION
- 6 DEMONSTRATING THAT THE PROPOSED WATER WITHDRAWAL IS LIKELY TO CAUSE
- 7 AN ADVERSE RESOURCE IMPACT. THE DOCUMENTATION SHALL INCLUDE 1 OR
- 8 MORE OF THE FOLLOWING:
- 9 (i) IDENTIFICATION OF SPECIFIC ERRORS IN DATA COLLECTION
- 10 PERFORMED BY THE PROFESSIONAL HYDROLOGIST OR HYDROGEOLOGIST THAT
- 11 RENDER THE ANALYSIS OF THE PROPOSED WITHDRAWAL INVALID.
- 12 (ii) A STATEMENT THAT THE PROFESSIONAL HYDROLOGIST OR
- 13 HYDROGEOLOGIST USED AN INAPPLICABLE MODEL TO ANALYZE THE PROPOSED
- 14 WITHDRAWAL, WITH AN EXPLANATION INCLUDING BOTH WHY THE MODEL
- 15 SELECTED FOR ANALYSIS WAS INAPPLICABLE FOR THE PROPOSED WITHDRAWAL
- 16 AND AN ANALYSIS USING AN APPLICABLE MODEL THAT SHOWS THE PROPOSED
- 17 WITHDRAWAL IS LIKELY TO CAUSE AN ADVERSE RESOURCE IMPACT.
- 18 (iii) IDENTIFICATION OF SPECIFIC ERRORS IN THE MODEL ANALYSIS
- 19 PERFORMED BY THE PROFESSIONAL HYDROLOGIST OR HYDROGEOLOGIST THAT
- 20 RENDER THE ANALYSIS OF THE PROPOSED WITHDRAWAL INVALID.
- 21 (iv) THE CUMULATIVE STREAMFLOW DEPLETION ESTIMATED FOR ALL THE
- 22 REGISTERED WATER WITHDRAWALS IN AN IMPACTED WATERSHED MANAGEMENT
- 23 AREA IS LIKELY TO CAUSE AN ADVERSE RESOURCE IMPACT. THE CUMULATIVE
- 24 STREAMFLOW DEPLETION CALCULATION SHALL ACCOUNT FOR REEVALUATION OF
- 25 PREVIOUSLY REGISTERED WATER WITHDRAWALS IN THE AFFECTED WATER
- 26 MANAGEMENT UNITS USING THE HUNT, 2003; WARD AND LOUGH, 2011; OR A
- 27 SIMILAR PEER-REVIEWED MODEL THAT ASSESSES POTENTIAL STREAM



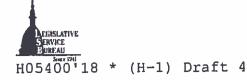
DEPLETION_

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- 2 (3) AFTER A PROPERTY OWNER REGISTERS A WITHDRAWAL PURSUANT TO
- 3 SUBSECTION (2), IF, IN DEVELOPING THE CAPACITY TO MAKE THE
- WITHDRAWAL, THE CONDITIONS OF THE WITHDRAWAL DEVIATE FROM THE 4
- 5 SPECIFIC DATA THAT WERE EVALUATED, THE PROPERTY OWNER SHALL NOTIFY
- THE DEPARTMENT OF THE CORRECTED DATA AND THE DEPARTMENT SHALL 6
- 7 CONFIRM ITS DETERMINATION UNDER SUBSECTION (2). IF THE CORRECTED
- DATA DO NOT CHANGE THE DETERMINATION, THE PROPERTY OWNER MAY 8
- PROCEED WITH THE WITHDRAWAL. IF THE CORRECTED DATA CHANGE THE 9
- DETERMINATION, THE PROPERTY OWNER SHALL PROCEED UNDER THE 10
- PROVISIONS OF THIS PART RELATED TO THE CORRECTED DETERMINATION. 11
- 12 (4) IF A PROPOSED WITHDRAWAL IS A ZONE B WITHDRAWAL IN A COLD-
- TRANSITIONAL RIVER SYSTEM, OR A ZONE C OR ZONE D WITHDRAWAL, AND A 13
- PROPERTY OWNER DOES NOT SUBMIT ANY OF THE INFORMATION DESCRIBED IN 14
- SUBSECTION (1) OR THE DEPARTMENT DETERMINES UNDER SUBSECTION (2)

 OR A ZONE B LUTTADANIAL IS A COLD-TRANSITIONAL. 15 RIVER
- THAT THE PROPOSED WITHDRAWAL IS A ZONE D WITHDRAWAL A THE PROPERTY 16 SYSTEM
- 17 OWNER MAY request for a site-specific review. Additionally, if the
- assessment tool determines that a proposed withdrawal is a zone A 18
- 19 withdrawal, or a zone B withdrawal in a cool river system or a warm
- 20 river-system and the property owner wishes to have a site-specific
- review, the property owner may submit to the department a request 21
- 22 for a site-specific review. A request for a site-specific review
- 23 shall be submitted to the department in a form required by the
- 24 department and shall include all of the following:
- 25 (a) The information described in section 32706a(3).
- (b) The intended maximum monthly and annual volumes and rates 26
- 27 of the proposed withdrawal, if different from the capacity of the

- 1 equipment used for making the proposed withdrawal.
- 2 (c) If the amount and rate of the proposed withdrawal will
- 3 have seasonal fluctuations, the relevant information related to the
- 4 seasonal use of the proposed withdrawal.
- 5 (d) A description of how the water will be used and the
- 6 location, amount, and rate of any return flow.
- 7 (e) Any other information the property owner would like the
- 8 department to consider in making its determination under this
- 9 section.
- 10 (5) (2)—Upon receipt of a request for a site-specific review
- 11 UNDER SUBSECTION (4), the department shall consider the information
- 12 submitted to the department under-subsection (1) and shall consider
- 13 the actual stream or river flow data of any affected stream reach.
- 14 The department shall also apply the drainage area aggregation
- 15 INTEGRATION standards provided in section 32706a(2)(a), (b), and
- 16 (c), if applicable, and account for cumulative withdrawals as
- 17 provided for in section 32706e. The department shall not rely on
- 18 the assessment tool's determination in making its determination
- 19 under a site-specific review. THE DEPARTMENT MAY CALCULATE
- 20 STREAMFLOW DEPLETION USING HUNT, 2003; WARD AND LOUGH, 2011; OR A
- 21 SIMILAR PEER-REVIEWED MODEL THAT ASSESSES POTENTIAL STREAM
- 22 DEPLETION. THE CALCULATION OF STREAMFLOW DEPLETION MAY ALSO BE
- 23 CONDUCTED ON EXISTING WITHDRAWALS IN THE SAME WATER MANAGEMENT UNIT
- 24 OR UNITS AS THE PROPOSED WITHDRAWAL IF APPLICABLE DATA IS
- 25 AVAILABLE. THIS DATA MAY BE USED TO PROVIDE ADDITIONAL EVIDENCE AS
- 26 NEEDED TO DEMONSTRATE WHETHER A PROPOSED WITHDRAWAL IS LIKELY TO
- 27 CAUSE AN ADVERSE RESOURCE IMPACT.



- 1 (6) (3)—The department shall complete its—A site-specific
 2 review within 10 working days of submittal of a request for a site3 specific review. If the department determines, based upon a site4 specific review, that the proposed withdrawal is a zone A or a zone
 5 B withdrawal, the department shall provide written notification to
 6 the property owner and the property owner may register the
 7 withdrawal and may proceed with the withdrawal.
- 8 (7) $\frac{(4)}{}$ Subject to subsection $\frac{(5)}{}$, if the department determines in conducting a site-specific review that the proposed 9 withdrawal is a zone C withdrawal, the property owner may register 10 the withdrawal and proceed to make the withdrawal if the property 11 owner self-certifies that he or she is implementing applicable 12 environmentally sound and economically feasible water conservation 13 measures prepared under section 32708a that the property owner 14 considers to be reasonable or has self-certified that he or she is 15 implementing applicable environmentally sound and economically 16 feasible water conservation measures developed for the water use 17 associated with that specific withdrawal that the property owner 18 considers to be reasonable. 19
- 20 (8) (5)—Except for withdrawals exempt from obtaining a water withdrawal permit under section 32723, if a site-specific review 21 determines that a proposed withdrawal is a zone C withdrawal with 22 capacity in excess of 1,000,000 gallons of water per day from the 23 waters of the state to supply a common distribution system, the 24 person proposing the withdrawal shall not register the withdrawal 25 26 and shall not proceed with making the withdrawal unless the person 27 obtains a water withdrawal permit under section 32723.

- 1 (9) (6)—If the department determines, based upon a site2 specific review, that the proposed withdrawal is a zone D
 3 withdrawal, the property owner shall not register the withdrawal
 4 and shall not make the withdrawal unless he or she applies for a
 5 water withdrawal permit under section 32723 and the withdrawal is
 6 authorized under that section.
- (10) (7)—After a property owner registers a withdrawal 7 following a site-specific review, if, in developing the capacity to 8 make the withdrawal, the conditions of the withdrawal deviate from 9 the specific data that were evaluated in the site-specific review, 10 the property owner shall notify the department of the corrected 11 data and the department shall confirm its determination under the 12 site-specific review. If the corrected data do not change the 13 determination under the site-specific review, the property owner 14 may proceed with the withdrawal. If the corrected data change the 15 determination under the site-specific review, the property owner 16 shall proceed under the provisions of this part related to the 17 corrected determination. 18
 - (8) Subject to subsection (9), prior to the implementation date of the assessment tool under section 32706a, a property owner proposing to develop withdrawal capacity on his or her property to make a new or increased large quantity withdrawal may submit to the department a request for an interim site specific review under this subsection to determine whether or not the proposed withdrawal is likely to cause an adverse resource impact. The department, upon request, shall conduct an interim site specific review under this subsection within a reasonable time period not to exceed 30 days

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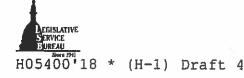
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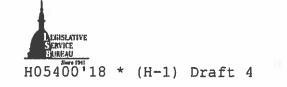
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- 1 based upon an evaluation of reasonably available information. For
- 2 purposes of this part, a determination under an interim site-
- 3 specific review under this subsection shall be afforded the same
- 4 status as a site-specific review otherwise conducted under this
- 5 section.
- 6 (9) Except for withdrawals exempt from obtaining a permit
- 7 under section 32723, a property owner who, prior to the
- 8 implementation of the assessment tool under section 32706a, intends
- 9 to develop withdrawal capacity on his or her property to make a new
- 10 or increased large quantity withdrawal of more than 1,000,000
- 11 gallons of water per day from the waters of the state to supply a
- 12 common distribution system shall obtain an interim site specific
- 13 review under subsection (8). If the interim site specific review
- 14 determines that the proposed withdrawal is a zone C withdrawal, the
- 15 property owner shall not proceed with making the withdrawal unless
- 16 the person obtains a water withdrawal permit under section 32723.
- 17 (11) AS USED IN THIS PART:
- 18 (A) "AQUIFER PERFORMANCE TEST" MEANS A CONTROLLED FIELD TEST
- 19 IN WHICH ALL OF THE FOLLOWING ARE DONE:
- 20 (i) AT LEAST 1 MONITORING WELL IS INSTALLED. THE MONITORING
- 21 WELL MUST BE INSTALLED IN THE SAME AQUIFER AND SCREENED AT OR NEAR
- 22 THE SAME DEPTH AS THE PRODUCTION WELL, AND BE LOCATED AT A DISTANCE
- 23 OF 1 TO 5 TIMES THE THICKNESS OF THE AQUIFER FROM THE PROPOSED
- 24 PRODUCTION WELL. A NEARBY EXISTING WELL MAY BE USED AS A MONITORING
- 25 WELL FOR THE TEST INSTEAD IF IT MEETS ALL THE MONITORING WELL
- 26 REQUIREMENTS.
- 27 (ii) STATIC WATER LEVEL ELEVATION MEASUREMENTS ARE TAKEN AT 1-



- 1 MINUTE INTERVALS FOR 24 HOURS BEFORE THE PUMPING PORTION OF THE
- 2 TEST TO AN ACCURACY OF 0.05 FEET.
- 3 (iii) PUMPING IS CONDUCTED AT A RATE AT OR ABOVE THE DESIRED
- 4 PRODUCTION RATE FOR THE DURATION OF THE TEST AND METERED OR
- 5 PERIODICALLY MEASURED TO ENSURE CONSISTENCY OF RATE.
- 6 (iv) THE PUMPING PORTION OF THE TEST IS CONDUCTED FOR A PERIOD
- 7 OF 24 HOURS IN CONFINED AQUIFERS OR 72 HOURS IN UNCONFINED
- 8 AQUIFERS, DURING WHICH DRAWDOWN MEASUREMENTS ARE TAKEN AT 1-MINUTE
- 9 INTERVALS TO AN ACCURACY OF 0.05 FEET.
- 10 (v) AFTER COMPLETION OF THE PUMPING PERIOD, MEASUREMENTS OF
- 11 WATER LEVEL RECOVERY ARE TAKEN AT 1-MINUTE INTERVALS FOR 24 HOURS
- 12 TO AN ACCURACY OF 0.05 FEET.
- 13 (vi) AN ANALYSIS IS CONDUCTED TO DETERMINE, AT A MINIMUM, THE
- 14 AQUIFER HYDRAULIC CHARACTERISTICS OF TRANSMISSIVITY AND STORAGE
- 15 COEFFICIENT EMPLOYING THE METHODS OF COOPER AND JACOB, 1946; THEIS,
- 16 1935; HANTUSH AND JACOB, 1955; HANTUSH AND JACOB, 1960; HANTUSH AND
- 17 JACOB, 1961; NEUMAN, 1972; NEUMAN, 1974; OR HUNT AND SCOTT, 2007.
- 18 (B) "COOPER AND JACOB, 1946" MEANS COOPER AND JACOB, 1946: "A
- 19 GENERALIZED GRAPHICAL METHOD FOR EVALUATING FORMATION CONSTANTS AND
- 20 SUMMARIZING WELL-FIELD HISTORY".
- 21 (C) "HANTUSH AND JACOB, 1955" MEANS HANTUSH AND JACOB, 1955:
- 22 "NON-STEADY RADIAL FLOW IN AN INFINITE LEAKY AQUIFER".
- 23 (D) "HANTUSH AND JACOB, 1960" MEANS HANTUSH AND JACOB, 1960:
- 24 "MODIFICATION OF THE THEORY OF LEAKY AQUIFERS".
- 25 (E) "HANTUSH AND JACOB, 1961" MEANS HANTUSH AND JACOB, 1961:
- 26 "AQUIFER TESTS ON PARTIALLY PENETRATING WELLS".
- 27 (F) "HUNT, 1999" MEANS HUNT, 1999: "UNSTEADY STREAM DEPLETION

- 1 FROM GROUND WATER PUMPING".
- 2 (G) "HUNT, 2003" MEANS HUNT, 2003: "UNSTEADY STREAM DEPLETION
- 3 WHEN PUMPING FROM SEMICONFINED AQUIFER".
- 4 (H) "HUNT AND SCOTT, 2007" MEANS HUNT AND SCOTT, 2007: "FLOW
- 5 TO A WELL IN A TWO-AQUIFER SYSTEM".
- 6 (I) "NEUMAN, 1972" MEANS NEUMAN, 1972: "THEORY OF FLOW IN
- 7 UNCONFINED AQUIFERS CONSIDERING DELAYED GRAVITY RESPONSE OF THE
- 8 WATER TABLE".
- 9 (J) "NEUMAN, 1974" MEANS NEUMAN, 1974: "EFFECT OF PARTIAL
- 10 PENETRATION ON FLOW IN UNCONFINED AQUIFERS CONSIDERING DELAYED
- 11 GRAVITY RESPONSE".
- 12 (K) "STREAMFLOW DEPLETION CALCULATION" MEANS AN EVALUATION OF
- 13 THE POTENTIAL STREAMFLOW DEPLETION IN WHICH ALL OF THE FOLLOWING
- 14 ARE DONE:
- 15 (i) THE STREAMBED CONDUCTANCE OF THE POTENTIALLY IMPACTED
- 16 STREAMS SHALL BE MEASURED IN-SITU USING SLUG TESTING, SEEPAGE METER
- 17 TESTING, OR BOTH.
- 18 (ii) AN AQUIFER PERFORMANCE TEST REPRESENTING THE PROPOSED
- 19 WITHDRAWAL LOCATION HAS BEEN COMPLETED.
- 20 (iii) AN ANALYSIS SHALL BE CONDUCTED TO CALCULATE STREAMFLOW
- 21 DEPLETION USING THE APPLICABLE METHOD OF HUNT, 1999; HUNT, 2003;
- 22 WARD AND LOUGH, 2011; OR A SIMILAR PEER-REVIEWED MODEL THAT
- 23 ASSESSES POTENTIAL STREAM DEPLETION. THE ANALYSIS MAY ALSO BE
- 24 CONDUCTED ON EXISTING WITHDRAWALS IN THE SAME WATER MANAGEMENT UNIT
- 25 OR UNITS AS THE PROPOSED WITHDRAWAL IF APPLICABLE DATA IS
- 26 AVAILABLE. THIS MAY BE USED TO PROVIDE ADDITIONAL EVIDENCE AS
- 27 NEEDED TO DEMONSTRATE A PROPOSED WITHDRAWAL IS UNLIKELY TO CAUSE AN



- ADVERSE-RESOURCE IMPACT. 1
- (1) "THEIS, 1935" MEANS THEIS, 1935: "THE RELATION BETWEEN THE 2
- LOWERING OF THE PIEZOMETRIC SURFACE AND THE RATE AND DURATION OF 3
- DISCHARGE OF A WELL USING GROUNDWATER STORAGE".
- (M) "WARD AND LOUGH, 2011" MEANS WARD AND LOUGH, 2011: "STREAM 5
- DEPLETION FROM PUMPING A SEMICONFINED AQUIFER IN A TWO-LAYER LEAKY 6
- AQUIFER SYSTEM".